ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES

1985
YUKON AREA
SALMON REPORT

to the
Board of Fisheries
November 1985

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BACKGROUND

Area Boundaries and Legal Gear

The Yukon area includes all waters of the Yukon River drainage in Alaska and coastal waters from Canal Point light near Cape Stephens to the Naskonat Peninsula. For management purposes, the area is divided into six districts and 10 subdistricts (Figure 1). Commercial and subsistence fishing occurs along the 1,200 mile length of the Yukon River (in Alaska) and in the lower 220 miles of the Tanana River. The Lower Yukon area (Districts 1, 2 and 3) includes the coastal waters of the area and that portion of the drainage from the mouth to Old Paradise Village (river mile 301). The Upper Yukon area (Districts 4, 5 and 6) is that portion of the drainage upstream of Old Paradise Village to the U.S./Canada border including the Tanana River drainage.

Legal commercial fishing gear consists of set and drift gill nets in the lower Yukon area and fishwheels and set gill nets in the upper Yukon area. Open skiffs powered by outboard motors are used to operate the fishing gear and deliver the fish to buyers. Subsistence gear commonly used to capture salmon include gill nets, fishwheels and beach seines.

Management Considerations

The overall objective of the Department's research and management programs is to manage the various salmon runs for optimum sustained yield.

Subsistence has been designated by the Legislature (State Law 151) as the highest priority among beneficial uses of fish and game resources. Except in areas where intensive commercial fisheries occur, the subsistence fishery is subject to few restrictions in order to give preference to subsistence users. The majority of Yukon River fishermen usually take salmon for both commercial and subsistence purposes in

major commercial fishing areas. Therefore, in order to enforce commercial fishing regulations, it is necessary to place some restrictions on the subsistence fishery. For example, during the commercial salmon fishing season in most areas, subsistence fishing is allowed only during the open commercial fishing periods. During the course of the year, however, substantially more subsistence fishing time is allowed than commercial fishing time.

Management is made difficult by the character of salmon runs, the nature of the various fisheries (for example, the rapid evolution of the lower Yukon set net fishery into a drift net fishery), and the river itself. Since most of the commercial fisheries have only developed or expanded in recent years, there is a lack of adequate escapement and return data on which to fully evaluate the effects of increased commercial harvests. The various fisheries, which are scattered over 1400 river miles, harvest mixed stocks usually several weeks and hundreds of miles from their spawning grounds. Because the Yukon River commercial fishery harvest mixed stocks, some tributary populations may be under- or overharvested in relation to their actual abundance. For example, in a mixed-stock fishery, where it is impossible to manage each stock separately, some small spawning populations may be reduced to very low levels or even eliminated.

New research projects are underway and other programs are planned, once additional funding becomes available, to obtain the biological information necessary for better management of the salmon runs. These include: (1) king salmon stock separation studies using scale analysis techniques (2) side-scanning sonar to obtain accurate daily and seasonal escapements in important tributaries (Anvik, Andreafsky, and Sheenjek Rivers), (3) expanded upper Yukon test fishing program, and (4) main river sonar feasibility study (near Pilot Point Station) to obtain estimates of total salmon abundance.

Management of the Yukon River commercial salmon fishery must be conservative because of the difficulty in determining run size, harvesting of mixed stocks, increased effort and efficiency of the commercial fleet, allocation problems, and the need to provide for upriver escapements and subsistence requirements. Important management techniques include establishing guideline harvest ranges, gill net mesh-size restrictions, weekly fishing periods, and season closures. If it becomes apparent during the fishing season (based on analysis of commercial catch and test fishery data) that the run is substantially smaller or larger than needed for escapement and subsistence requirements, commercial fishing time is adjusted through the use of the emergency order or, less frequently, emergency regulation authority.

Status of Fishery, Stocks, and Management Strategies

All five species of Pacific salmon occur in the Yukon River, with chums being the most abundant, followed by kings, cohos, pinks, and reds. Commercial salmon fishing (for kings) on the Yukon dates back to 1918, but the multi-species salmon fishery did not become fully developed until the mid-1970's. In the Alaskan portion of the Yukon, the average commercial salmon harvest for the period 1980 - 1984 is 1.4 million fish (Table 1). An average of 483,000 salmon is taken additionally each year for subsistence use (Table 2).

Approximately 900 commercial fishermen (700 in the 3 lower districts) and 20 processors participate in the fishery. The ex-vessel value of the salmon catch has averaged $7.3 million for the most recent 5 year period.

King Salmon

King salmon spawning populations are widely distributed throughout the Alaskan and Canadian portions of the Yukon River drainage. Major spawning streams in Alaska include the Andreafsky, Anvik, Nulato, Salcha

and Chena Rivers; in the Canadian portion of the drainage (Yukon Territory), important king salmon systems include the Big Salmon and Nisutlin Rivers. King salmon escapement trends are shown in Table 6. In general escapements to most index streams have increased since 1976.

Annual subsistence catches of king salmon in Alaska during 1964 - 1984 ranged from 12,000 - 49,000 (23,500 average). During the past 5 years, subsistence king catches have increased (38,500 average) due to above average size runs. (Table 2). In the Yukon Territory (Canada), the recent 5 year average subsistence catch is 8,600 kings.

During the period 1960 - 1971, the commercial catch of king salmon in Alaska ranged from 67,600 to 129,700 and averaged 101,700. Yukon king salmon runs generally declined in magnitude during the early to mid-1970's, and average commercial harvests dropped to 83,700 during the period 1972 - 76. This decline of Yukon River king salmon is partially attributed to interceptions by the Japanese high seas mothership fishery.

Reductions in high seas interceptions (except 1980), a series of mild winters, and more restrictive management of the inshore fishery have combined to produce a series of above average king salmon returns since 1976. For the period of 1980 through 1984, average commercial harvests (in Alaska) increased to 140,800 (Table 1). During the same period, commercial catches in the Yukon Territory averaged 9,900 kings.

Timing of king salmon runs is highly variable, in response to spring weather conditions. Opening of the commercial fishery in the lower river is likewise variable and usually occurs between June 5 and June 15 by emergency order. The season is opened only after it is determined (by monitoring of test fishing and subsistence catches) that a sustained in-migration of fish is occurring and that the early portion of the run has passed through the lower river. This strategy allows fishery managers an opportunity to assess run strength prior to intensive

commercial fishing effort, spreads fishing effort over a larger portion of the run, and affords subsistence fishermen an opportunity to harvest fish for their domestic needs prior to implementation of restrictive commercial fishing periods.

During the king salmon season, when there are no gillnet mesh size restrictions, commercial and subsistence fishing in Districts 1, 2, and 3 are regulated by emergency order and are normally allowed for two-24 hour periods per week. Regulations adopted by the Board of Fisheries prior to the 1983 season allow an additional subsistence fishing period every other weekend in districts 1 and 2 through July 19. In Districts 4, 5, and 6 fishing occurs during two-48 hour periods per week. Duration and frequency of fishing periods may be changed by emergency order, depending on run strength as indicated by comparative commercial and test catches.

A guideline harvest range of 60,000 - 120,000 king salmon for Districts 1 and 2 has been established by the Board of Fisheries. The midpoint (90,000) of this guideline harvest range should be the expected catch if the run is of average magnitude. If a very large run occurs, then the upper end (120,000) of the guideline harvest range may be exceeded. Consequently, fishing time may be reduced in Districts 1 and 2 to more evenly distribute harvest throughout the run, even in years of large runs. Commercial king salmon harvests in Districts 3 - 6 are likewise regulated by guideline harvest ranges which allow an additional (combined) harvest of 7,350 to 9,150 kings.

Summer Chums

Summer chums are the more abundant of the two chum salmon runs that occur in the Yukon River. Summer chums can be distinguished from fall chums by the following characteristics: (1) earlier run timing (early June to mid-July in the lower river); (2) rapid maturation in fresh water; (3) smaller body size (6 - 7 lbs.); (4) greater population size

and (5) spawning occurs primarily in lower 600 miles of the drainage.

The Anvik River supports the largest spawning population; other important spawning areas include the Andreafsky, Nulato, Rodo, Salcha and Hogatza River drainages. Although runs fluctuate greatly in abundance from year to year, Yukon summer chum stocks, with possible exceptions, have not experienced declining escapements (Table 7). Documented harvests and escapements during recent years show minimum run sizes ranging from 1.2 to 5.6 million fish.

Regulations regarding harvest and sale of summer-run chum salmon were liberalized beginning with the 1967 season. By 1973 most gillnet mesh-size restrictions were lifted in order to afford fishermen an opportunity to use small-mesh gill nets, which select for the more abundant chum salmon. Prior to this time, commercialization of this species had been limited because of its importance to upriver subsistence fisheries. Presently, the summer chum salmon subsistence fishery takes 242,500 fish annually (1980-1984 average) (Table 2).

The summer chum commercial fishery has developed rapidly in recent years. From 1967 through 1983 harvests ranged from 11,200 to 1.2 million fish, and the most recent 5 year average is 902,900 (Table 1). A regulation was promulgated prior to the 1976 season which established a range of dates (from June 27 to July 5 in Districts 1 and 2, and July 5 to July 15 in District 3) after which only gill nets of 6-inch or smaller mesh can be used. This regulation serves not only to minimize capture of large female king salmon during the late portion of the king run, but also to optimize the harvest of the abundant summer chums migrating through the lower river fishery during late June - early July.

Management of summer chums is complicated by the fact that both king and summer chum salmon exhibit similar run timing. Because of the overriding importance of king salmon, the harvest of chums in the lower river is greatly dependent on the regulations and management strategies

employed toward the more intensively managed king salmon fishery. Even if an exceptionally large run of summer chums develops, the harvest of that species may be no more than average because of restrictions imposed on the fleet for the conservation of kings.

Guideline harvest ranges are used to regulate the harvest of kings and fall chums but have not been established for summer chums.

The majority of summer chums harvested in the upper Yukon districts is taken in subdistrict 4-A. A statewide abundance of ocean-caught salmon in recent years has adversely affected the marketability of upriver summer chum salmon because of their relatively poor flesh quality; however, large amounts of high quality roe continue to be produced in this area.

Fall Chums

Fall chums have the following differentiating characteristics from summer chum salmon: (1) later run timing (mid-July to early September in the lower river); (2) larger size (7 - 9 lbs.) and robust body shape and bright silvery appearance in the lower river; (3) smaller population size; and (4) spawning that occurs in the upper portions of the drainage in spring fed streams.

Major spawning areas are located in the Porcupine River drainage (Sheenjek River in Alaska and Fishing Branch River in Canada) and the Tanana River drainage in Alaska (Toklat River, Delta River, and mainstem Tanana upstream of Fairbanks) (Figure 2). Spawning occurs during September through mid-November.

Porcupine River and upper Yukon fall chums are distinguished from Tanana River fall chums by their earlier run timing and their orientation along the north bank of the Yukon River (mile 530-700), as opposed to the south bank orientation of Tanana drainage fall chums.

There has been a serious decline in fall chum salmon escapements in recent years (since 1980) for some of the major spawning areas. Average escapements in the Sheenjek River, Fishing Branch River, and Toklat River have decreased 47%, 81%, and 66% respectively during 1980 - 84 compared to the previous 5-year period (1975 - 1979). Escapements in 1982 to most streams were the lowest ever recorded. Escapement objectives have not been met in recent years for some spawning streams. Annual fall chum escapements for major index areas are presented in Figure 3 and Table 8.

The total utilization (commercial and subsistence catch combined) of fall chums in Alaska during the period 1981 - 1984 has averaged 477,500, an increase of 8% compared to the previous four year period (1977 - 1980) of 441,400 (Table 4). In the lower Yukon area the majority of the fall chums are utilized for commercial purposes while in the upper Yukon area more fall chums are taken for subsistence. In the Canadian portion of the drainage the combined commercial and subsistence harvest of fall chums is 23,900 (1980-1984 average) (Table 5).

Fall chum salmon subsistence catches in Alaska have increased in recent years particularly in District 5. The average subsistence catch in Alaska during the recent 5-year average (1980 - 1985) is 172,300 (Table 2). Subsistence fall chum catches have increased 18% during period 1981 - 1984 compared to the previous 4 years. In District 5 subsistence fall chum catches have increased 43% during 1981 - 1984 compared to the previous 4-year period. Comparative commercial and subsistence fall chum salmon catches by district for the period 1977 - 1984 are presented in Table 4. Historical Alaska subsistence catch data are shown in Figure 4. In the Yukon Territory (mostly at Old Crow) approximately 7,000 fall chums are taken annually (recent 5-year average) (Table 5).

Commercial fall chum catches have also increased recently. In Alaska the recent 5-year average (1980 - 1984) harvest is 303,900 compared to

the previous 5-year average of 262,400, an increase of 16% (Table 1). Historical Alaska commercial fall chum catch data are presented in Figure 4. In the Yukon Territory the commercial catch has also increased; from 4,000 (1975 - 1979 average) to 16,900 (1980 - 1984 average) annually (Table 5).

In response to the poor run experienced during 1982, difficulties in assessing in-season run strength, and the increasing efficiency of the fleet, the Alaska Board of Fisheries adopted several important regulatory restrictions. These restrictions were required to help prevent overharvesting of specific run segments and to distribute the harvest throughout the run. The following is a summary of changes implemented by the Board beginning in 1983:

1. Commercial Fishing Season

   Provides for an approximate 7-10 day closure of the commercial fishing season for the lower Yukon area in late July during the early portion of the fall chum run.

2. Set-Net-Only Area

   During the fall chum commercial fishing season in coastal areas of District 1, commercial fishermen are restricted to the operation of set gill nets in a special "Set-Net-Only" area.

3. Weekly Fishing Periods

   Fishing periods were established by emergency order in the lower Yukon area. Fishing time was reduced to two-24 hour periods per week in District 3 and in the set-net-only area of District 1. In other areas of District 1 and in District 2 fishing was allowed for two-12 hour periods per week.

4. Guideline Harvest Ranges

   The Board of Fisheries directed the Department to target

toward the lower end of the present guideline harvest ranges unless the run is of very large magnitude.

5. Subsistence Fishing

The aforementioned reduced commercial fishing periods affect the subsistence fishery since fishing time for both fisheries is coincidental. An additional fishing period (24 hours) each weekend for subsistence is allowed in District 1 (excluding the set net area) and in District 2 after the reopening of the fishing season in late July.

PROPOSED REGULATION CHANGES

Commercial and subsistence fall chum catches have increased since 1980 while escapements have declined. Additional regulatory restrictions are needed to provide for greater escapements and to reduce the risk of overharvesting anticipated weaker returns. Poor returns of fall chums are expected beginning in 1986, and the following options are recommended for improving management of the fishery:

1) Reduce the commercial harvest of fall chums. It is recommended that the present guideline harvest ranges be reduced by 50% for the entire river. This restriction would result in a reduction of approximately 100,000 fall chums compared to present guideline harvest levels. A reduction in the commercial harvest will allow for increased escapements (Proposal #150).

2) Establish separate guideline harvest ranges in the lower Yukon area. Separate guideline harvest ranges for each district instead of combined harvest ranges in Districts 1, 2, and 3 would minimize the overharvesting of fall chum stocks especially in District 1 where the fishing effort is concentrated. In addition, coupled with proposed restrictions in fishing time, the harvest would be "spread out" over a greater portion of the run (Proposal #151).

3) Establish a July 15 closure date in the lower Yukon area. Providing for a uniform closing date for all districts in the lower Yukon area (presently closed beginning July 19-25) would allow for better monitoring of the fall chum salmon guideline harvest range. During the closure fall chum run strength would be assessed by test fishing and sonar programs. The commercial fishing season would probably reopen after a 7-14 day closure and only chums taken after the reopening would be counted toward the fall chum salmon guideline harvest range (Proposal #153).

4) Establish fishing periods by emergency order in Districts 4, 5, and 6 and reduce fishing time in all districts. Providing for emergency order announcement of fishing periods will allow for greater management flexibility to ensure that spawning requirements are achieved. An approximate 50% reduction in fishing time in all districts will allow for the harvest to be distributed over a greater portion of the run and to minimize overharvest of specific stocks (Proposal #154).

5) Reduce weekly subsistence fishing periods by 1-2 days during commercial fishing season closures greater than 5 days. Total exploitation, both commercial and subsistence fisheries, have increased since 1980 while escapements have declined. A moderate reduction in subsistence fishing time along with major commercial fishery restrictions will allow for increased escapements (Proposal #158).

Coho Salmon

Coho Salmon enter the river during August and early September. Escapement information is very limited. Comparative escapement information for this species is available only from the Tanana River drainage, where escapements appear to have been relatively stable during

the last 10 years. The Delta Clearwater River near Delta Junction supports the largest known population within the Yukon drainage.

The commercial harvest of coho salmon in the lower Yukon area is dependent upon the timing and duration of the fall chum season. Coho migration in the lower river peaks during mid- to late August. Cohos are taken incidentally to to the fall chum fishery in most districts, but in some years contribute substantially to the commercial and subsistence harvests, especially in the Tanana River. Commercial catches in the Yukon area during the period 1980 - 1984 have averaged approximately 33,000 cohos (Table 1). Approximately 30,000 cohos are also taken annually (recent 5-year average) for subsistence (Table 2).

1985 SEASON SUMMARY

Area Summary

In 1985, a total of 1,237,224 salmon was harvested commercially in the Yukon area. The catch was composed of 146,188 kings; 765,622 summer chums; 267,744 fall chums; and 57,670 cohos (Table 3). The king salmon catch was above the previous 5-year average while the chum salmon catch was below average. The coho salmon harvest was the second largest on record. In addition, a record 251,150 lb of salmon roe was sold by upper Yukon area fishermen. Commercial catch data for 1985 is preliminary pending final computer data processing of fish tickets.

Yukon River fishermen received an estimated $7,012,000 for their catch, similar to the recent 5-year average. Eleven buyer-processors operated in the lower Yukon area, and 13 buyer-processors and 13 catcher-sellers operated in the upper Yukon area.

In 1985 lower Yukon fishermen received an average price of $1.50 per lb for king, $0.35 per lb for summer chum, $0.47 per lb for fall chum, and $0.53 per lb for coho salmon. Upper Yukon commercial fishermen received

an estimated per-pound average price of $0.86 for kings, $0.23 for summer chums, $0.25 for fall chums, $0.33 for coho, and $1.94 for salmon roe.

Subsistence harvest survey information is still being compiled, but it is projected that the catch will approximate 40,000 kings; 250,000 summer chums; 192,000 fall chums; and 50,000 cohos.

King Salmon

The timing of the king salmon migration in the lower Yukon area was extremely late as anticipated by the cold temperatures and late breakup of river ice. The mean April Nome air temperature was 1.4° F (17.5° F lower than normal). The lower river was generally free of ice by 5 June. The first king salmon was reported caught on 14 June at Alakanuk by a subsistence fisherman.

Significant test fishing and subsistence catches occurred 18 June and increased sharply in the south mouth prior to the opening of the commercial fishery.

The commercial fishery was opened by emergency order after subsistence and test fishing catches indicated that the early portion of the king salmon run had passed through the lower river. In accordance with the Yukon Area Salmon Management Plan the fishing season was opened on a staggered basis: 24 June in District 1, 26 June in District 2, and 1 July in District 3. These were the latest opening dates in the history of the fishery. A fishing schedule of two-24-hour fishing periods per week was established by emergency order.

Commercial and test fishing catch data indicated the king salmon run to be above average in magnitude. The management plan provides for the upper end of the 60,000 to 120,000 king salmon guideline harvest range for Districts 1 and 2 to be taken if the run is of a large magnitude.

As of 2 July, the inseason estimated harvest in Districts 1 and 2 was approximately 92,000 king salmon which were captured primarily with large mesh size gill nets. At this time the "king salmon season" was closed (fishing with unrestricted mesh size), and fishing was allowed only with gill nets of 6 in or smaller mesh size effective 3 and 5 July for Districts 1 and 2, respectively. This allowed one more unrestricted mesh size fishing period in District 2, and it was also anticipated that an additional 10-20,000 king salmon would be harvested with 6 in or smaller mesh gill nets. Both Districts 1 and 2 had three fishing periods each during the "king salmon season," the least amount of fishing time in the history of the fishery. During the "king salmon season" a total of 114,300 kings was taken in Districts 1 and 2. An additional 24,076 kings were taken with 6 in or smaller mesh size gill nets. The total season harvest of king salmon was 90,011 and 48,365 in Districts 1 and 2, respectively. In District 3, which is managed under a 1,800 to 2,200 guideline harvest range, a total of 2,588 king salmon was taken. The total lower Yukon area king salmon harvest was 140,964 and above the recent 5-year average of 133,665.

The first reported kings in District 4 were reported taken in Grayling on 27 June and in Kaltag on 28 June. No commercial landings were made in Subdistrict 4-A. The total reported commercial harvest of 664 kings from Subdistricts 4-B and 4-C is thought to be a function of the limited market in those areas and the tendency to retain king salmon for personal use rather than a reflection of run strength.

Run strength in the lower portion of District 5, as indicated by commercial catches, indicated a run (predominately Yukon Territory stocks) of only average magnitude. For this reason, an emergency order was issued that closed the commercial season on 20 July. Total catch for Subdistricts 5-A, 5-B, and 5-C combined was 2,984 kings. Based on reported landings, the peak of the king salmon run occurred during the period 16 - 18 July. Subdistrict 5-D is managed independently of the lower portion of the district, and the season in that area was closed by

emergency order on 20 August; total catch for this subdistrict was 434 king salmon.

A reported total of 1,142 kings was harvested commercially from District 6 (Tanana River); of those, only 15 fish were landed in Subdistrict 6-A, and the balance came from the Nenana and Fairbanks areas.

In the lower portion of the drainage (downstream of the Anvik River) aerial surveys of the index streams documented excellent escapements. In both the Anvik and Andreafsky River drainages minimum escapement objectives were exceeded. In the Anvik River 720 king salmon in the McDonald Creek to Yellow River index area were observed (300-500 escapement objective). In the East Fork of the Andreafsky River 1,617 king salmon were observed (1,100-1,600 E.O.) and in the West Fork 2,248 king salmon were observed (700-1,000 E.O.).

In the upper Yukon area (Alaska portion of the drainage) minimum escapement objectives were also exceeded in all streams for which objectives have been established. The following escapements were documented: Nulato River 2,780 kings (1,000 E.O.), Gisasa River 725 kings (650 E.O.), Chena River 2,545 kings (1,000-1,700 E.O.), and Salcha River 2,027 kings (1,500-3,500 E.O.).

In the Yukon Territory, escapements in the major index areas were below average. Escapements were similar to 1982 but below the very large escapements of 1980 and 1981. In the major index areas documented escapements in 1985 were as follows: Big Salmon River (801), Nisutlin River drainage (615), and Whitehorse Dam Fishway (444).

Comparative king salmon escapement estimates are presented in Table 6.

Summer Chum Salmon

Similar to king salmon, the summer chum salmon migration was very late.

The first summer chum salmon was caught on 15 June by a subsistence fisherman near Emmonak. As in 1984, the summer chum run peaked during the "king salmon season." Daily test net catches during the last week of June were usually over 200 chum salmon in two Big Eddy 5 1/2 in mesh test gill nets. Although the summer chum salmon migration was very strong, only 437,377 were harvested in the lower Yukon area, well below the previous 5-year average of 667,748. The catch by district was: 247,486 (District 1), 188,099 (District 2), and 1,792 (District 3). There appeared to be very low effort with small mesh gear targeted at summer chum salmon during periods allowing unrestricted mesh size gill nets. The majority of the harvest was taken when gill nets were restricted to 6 in maximum mesh size.

In District 2 a special 6-hour period with 6 in or smaller mesh size gill nets was allowed on 2 July. This management strategy of allowing use of 6 in or smaller mesh gear during the "king salmon season" was endorsed by the Board of Fisheries in November 1984 in an attempt to utilize surplus summer chum salmon during very large runs. The opening worked well as a total of 39,997 summer chum salmon was taken compared to 1,557 king salmon.

Fishing time during the "summer chum salmon season" (early mid-July) in Districts 1 and 2 was two-24-hour periods per week. Due to a lack of markets, no summer chum salmon were taken in District 3 after the "king salmon season."

As in the past several years, only a very limited market existed in District 4 for summer run chums; as a result, roe was again the primary fishery product from this area. A total of 247,085 lb of unprocessed roe was delivered during the summer season, approximately 90% of which originated in Subdistrict 4-A. A total of 12,215 chums (in the round) was sold, primarily from Anvik and Ruby. Catches peaked during the two periods that occurred between 7 July and 12 July, during which time approximately 115,000 lb of roe were produced. Roe deliveries this year

exceeded the previous record (188,300 lb in 1979) by nearly 24%. A total of 77 fishermen made deliveries during the course of the summer season, which approximates the 1979 - 1983 average and is substantially higher than the number (54) who fished during 1984 when a price dispute idled many local fishermen.

Summer chums are sold in District 5 only incidentally to the king salmon fishery; a total of 700 chums were commercially harvested during the 1985 season.

A record harvest of 68,453 summer chums was made in District 6 this past season. The first deliveries were not made until 20 July, and catches peaked during the period 2 - 4 August. This year's harvest exceeded last year's record summer chum catch of 56,249 by 21% and is more than double the previous 5-year average.

Summer chum salmon escapements were variable in the lower Yukon drainage. In the Anvik River a total of 1,038,241 fish, the second highest escapement recorded, was enumerated by sonar. This escapement was more than double the optimum escapement objective of 487,000 fish. However, in the Andreafsky River system, escapement was below the minimum established objectives. In the West Fork of the Andreafsky River 52,750 summer chum salmon (62,000-116,000 escapement objective) were observed by aerial survey. In the East Fork of the Andreafsky River 66,146 summer chum salmon (76,000-109,000 E.O.) were observed.

In the upper Yukon area escapement objectives were exceeded in the Hogatza River as 22,566 summer chums were observed (10,000 to 17,000 escapement objective) but were not achieved in the Salcha River where 3,178 chums were observed (3,500 E.O.).

Comparative summer chum salmon escapement information is presented in Table 7.

Fall Chum and Coho Salmon

In the lower Yukon area the percentage of fall chum salmon in the test net catches increased steadily after mid-July, and by 25 July essentially all were fall chum salmon. The fishing season was closed effective 19 July in District 1 and 22 July in District 2 to afford protection for the early fall chum salmon run. A total of 14,154 fall chum salmon was caught toward the guideline harvest range when the season closed.

The commercial fishery season was reopened effective 1 August in District 1, 4 August in District 2, and 5 August in District 3. Fishing was allowed for two-24 hour periods per week in the "Setnet Only Area" (along the coast) in District 1. After the reopening of the fishing season both commercial and test fishing data indicated average run strength. The fishery was closed effective 13 August in District 1, 11 August in District 2, and 13 August in District 3. At the time of the closure a total of 166,183 fall chum salmon had been harvested of which 65,337 were caught during the last period in District 1.

After the closure the fall chum salmon run continued at a moderate rate, as indicated by test fishing data. Since the coho salmon run was judged above average in magnitude, a 6-hour fishing period was allowed in District 2 on 22 August in an effort to utilize surplus coho salmon. During this last period a total of 9,567 coho and 9,419 fall chum salmon was taken. This brought the total fall chum salmon harvest to 175,602 (129,948 in District 1, 40,490 in District 2, and 5,164 in District 3) which approached the midpoint of the 120,000 to 220,000 guideline harvest. The harvest was below the recent 5-year average of 224,377 fall chum salmon.

The lower Yukon area coho salmon catch of 44,972 was the second largest in history. The coho salmon catch by district was as follows: District 1 (27,676), District 2 (17,125), and District 3 (171).

In District 4 the harvest of 24,452 fall chums and 2,525 lb of roe combined was the largest fall chum catch in this district since 1980. This is attributed to both a larger run than in recent years and the presence of two buyers in Galena, one of which was tendering fish out of Ruby for most of the season. Catches in Subdistricts 4-B and 4-C peaked during the period 28-30 August. The coho catch for the district was 938 fish, 785 of which came from Subdistrict 4-C (south bank).

Subdistricts 5-A, 5-B, and 5-C were opened by emergency order on 24 August for one-24-hour period. The harvest for that period was 10,736 and a decision was made to have one additional 36-hour period 27 to 29 August. An additional 12,424 fish were taken during this second period. This harvest level (23,160) approximates the midpoint of the guideline harvest range (8,000 to 36,000) for these subdistricts.

Based on north bank test fishwheel catches in the Ruby area and on numerous reports from fishermen, a large number of fall chums entered the lower portion of District 5 in early September and continued for approximately 12 days. It is clear that at least a portion of these fish (based on Sheenjek River sonar counts) were bound for the (lower) Porcupine drainage. Reports from fishermen in Eagle indicate a strong mainstem surge of fish as well, and Canadian fisheries officials report a record catch of 32,000 fall chums from the Dawson area commercial fishery.

Catches from Subdistrict 5-D which were managed on the basis of a separate guideline harvest range were 2,178. The fall fishery in this area was opened by emergency order on 13 September and closed by regulation on 30 September; only one fisherman participated in the harvest.

Reports of subsistence catches in the Nenana, Fairbanks, and Manley areas during early to mid-September indicated Tanana River fall chum and

coho runs to be above average in size. These indicators were supported by catches at the south bank test fish site near Ruby. Between 15 August and 13 September catches during the 1985 run were more than double the cumulative average catches for the 1982 - 1984 period.

An emergency order issued on 11 September provided for two-24-hour fishing periods. Catch for the first period (15 - 16 September) was 14,056 chum and 4,321 coho. The second period (17 - 18 September) produced 10,331 chum and 3,037 coho. Comparative catch data for previous years indicated this to be a very strong run, and for this reason, a third 24-hour period was allowed 24 - 25 September. The rationale behind delaying the third period for several days was to attempt to meet escapement and subsistence fishing requirements, and it was thought that the delay would allow a larger harvest from an apparently strong coho salmon run. Total harvest for the Tanana River fall season was a record 42,352 fall and 11,760 coho salmon.

Based on currently available catch and escapement data, the 1985 fall chum run as expected was above average in magnitude. Lower Yukon area commercial and test fishing catch data in late July to August indicated average run strength. However, subsequent upper Yukon catch data indicate a strong run magnitude. Escapement information is preliminary at the time this report was written. In the Porcupine River system the sonar count of 117,668 in the Sheenjek River is the highest escapement in the 5-year history of the project. In addition, an above average escapement of 56,100 fall chums was enumerated past the Fishing Branch River weir (upper Porcupine River drainage, Yukon Territory). In the upper Toklat River area a total of 21,824 chums were enumerated by foot survey and 16,254 by aerial survey (22,000 escapement objective). In the Delta River 16,158 chums were enumerated by foot survey and 12,225 by aerial survey (7,900 escapement objective).

OUTLOOK FOR 1986

King Salmon

In most years, the dominant age class returning is 6 year-old-fish; however, 5- and 7-year-old fish also contribute to the run. The 1980 brood year run (6-year-olds in 1986) was judged above average in abundance as indicated by comparative catch and escapement data. The return of 5-year-olds (1981 brood year) is expected to be significant, based on above average run strength in 1981. Seven-year-olds are expected to contribute significantly to the run in 1985, based on the above average return of 6-year-olds in 1985. In summary, based on evaluation of brood year run size data and assuming average survival, it is expected that the 1986 Yukon River king salmon run will be above average in magnitude. The expected commercial harvest is expected to total 110,000 - 130,000 fish.

Summer Chum Salmon

Normally, Yukon River summer chum salmon runs are predominately composed of 4-year-old fish, although in some years 5-year-old fish are present in large numbers. The return of 4-year-olds in 1986 will be dependent on the strength of the 1982 brood year and the survival of the resulting offspring. Based on the available catch and escapement data, the magnitude of the 1982 summer chum salmon run was judged below average to average in abundance. The return of 4-year-olds in 1986 is expected to be of similar magnitude. The return of 5-year-olds is expected to be significant based on the above average return of 4-year-olds in 1985. In summary, based on evaluation of brood year run size data and assuming average survival, the magnitude of the Yukon River summer chum salmon run in 1986 is expected to be average. The commercial harvest is expected to total 600,000-1,200,000 fish.

Fall Chum Salmon

Similar to the summer run, the majority of the fall chum salmon returning each year is 4-year-old fish. The magnitude of the 1982 run (4-year-olds) was judged very poor based on comparative catch and escapements which were the lowest ever recorded in some streams. The return of 4-year-olds in 1986 is expected to be of similar magnitude. The return of 5-year-olds (1981 brood year) may contribute to the run based on on the apparent average to above average return of 4-year-olds in 1985. In summary, based on evaluation of the 1982 brood year escapements and assuming average survival, a poor return is expected in 1986. If the actual return is weak, commercial catches will be restricted and some commercial fisheries may not be opened at all in order to achieve escapement objectives.

Coho Salmon

Four-year-old fish (1982 brood year) are the dominant age class. Adequate escapement information for coho salmon is lacking, but escapement surveys in the Tanana River system indicated above average run strength in 1982. The harvest in 1986 is expected to total 20,000 - 40,000 fish, depending on the amount of fishing effort directed on the fall chum run and duration of the fishing season.

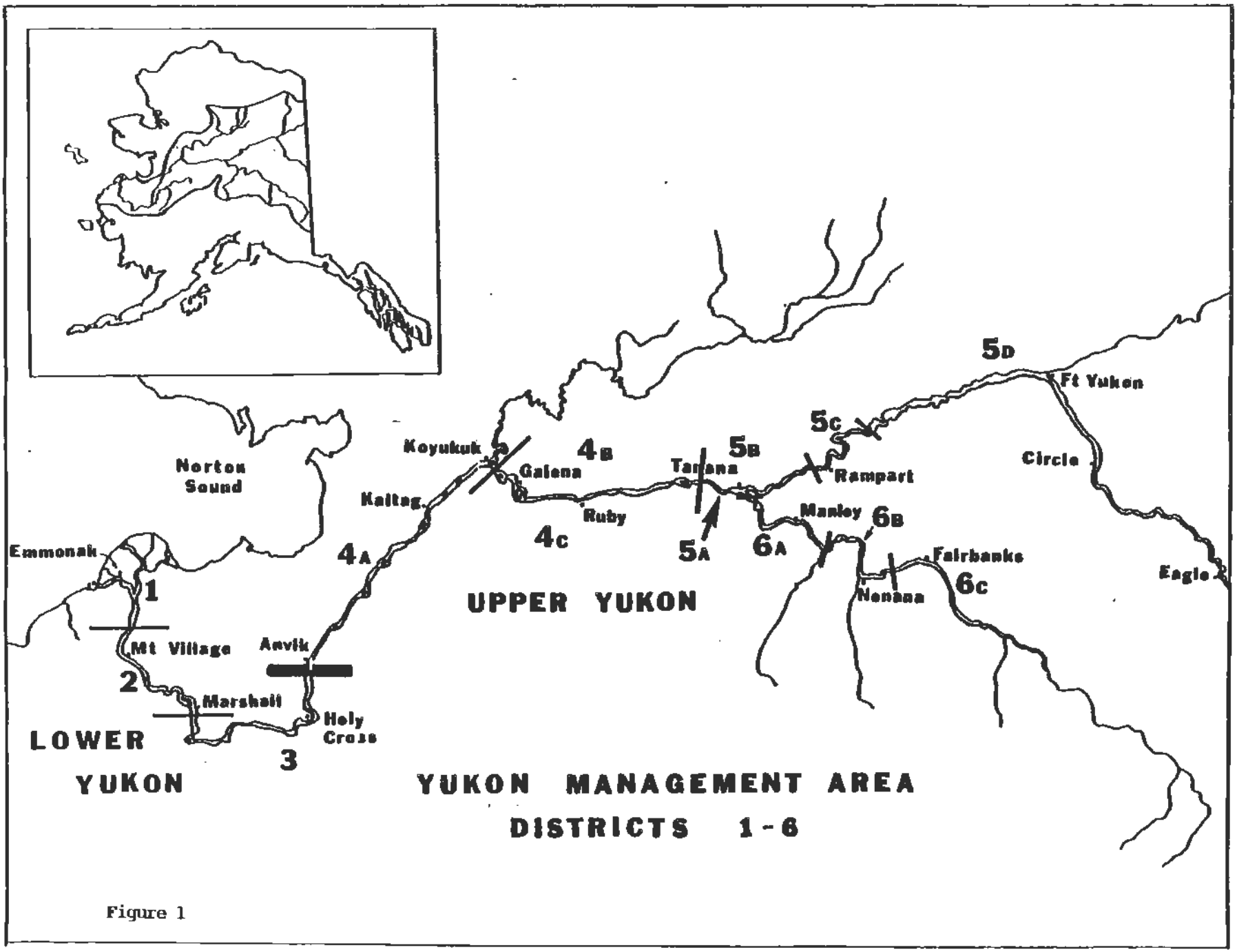
Norton Sound
Koyukuk
Galena
Kaltag
Ruby
Tanana
Rampart
Manley
Nenana
Fairbanks
Ft Yukon
Circle
Eagle
Emmonak
Mt Village
Anvik
Marshall
Holy Cross
1
2
3
4A
4B
4C
5A
5B
5C
5D
6A
6B
6C
LOWER YUKON
UPPER YUKON
YUKON MANAGEMENT AREA
DISTRICTS 1-6

Figure 1

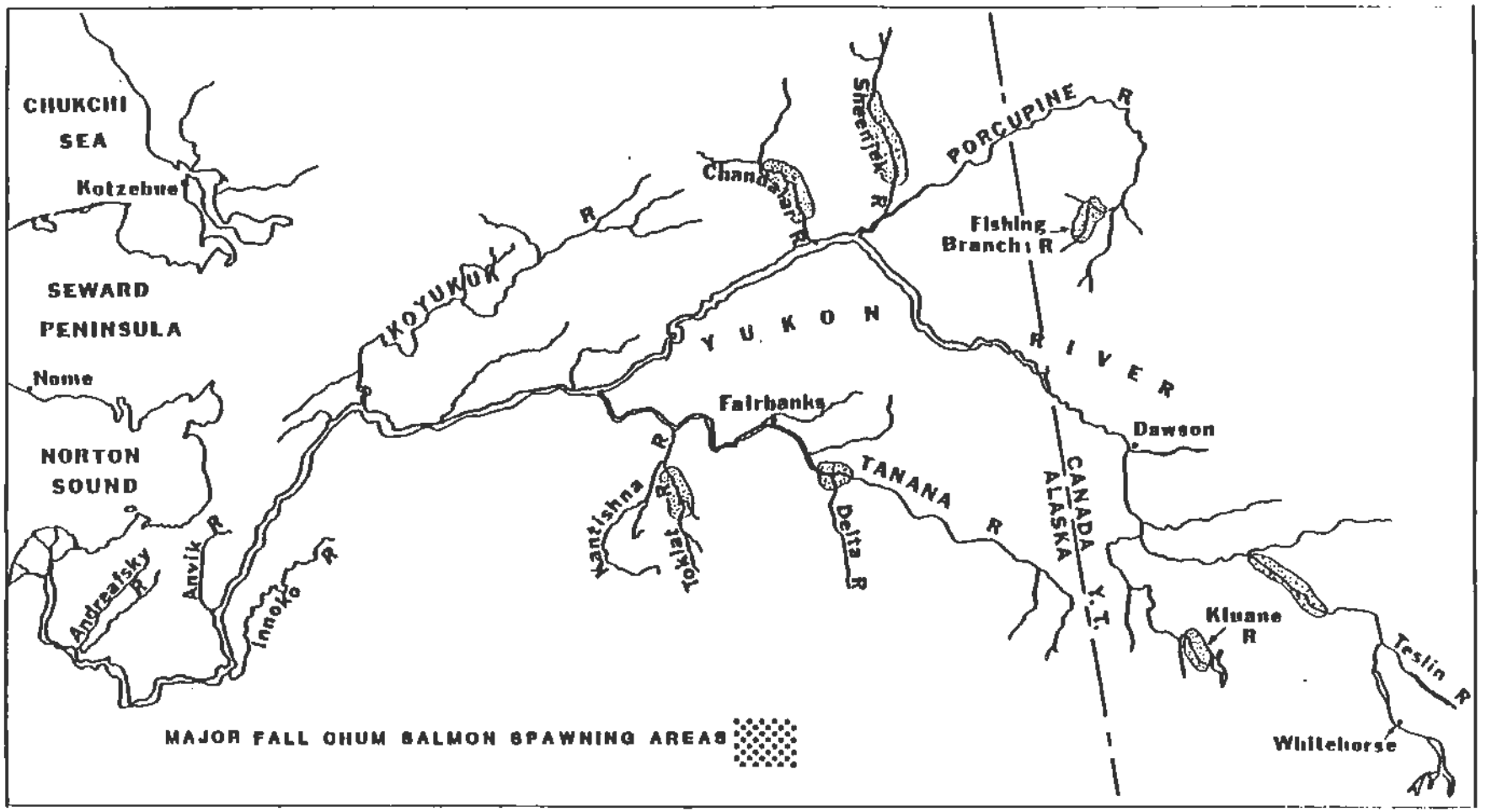

Figure 2. Fall chum salmon spawning areas in the Yukon River drainage. (Not drawn to scale.)

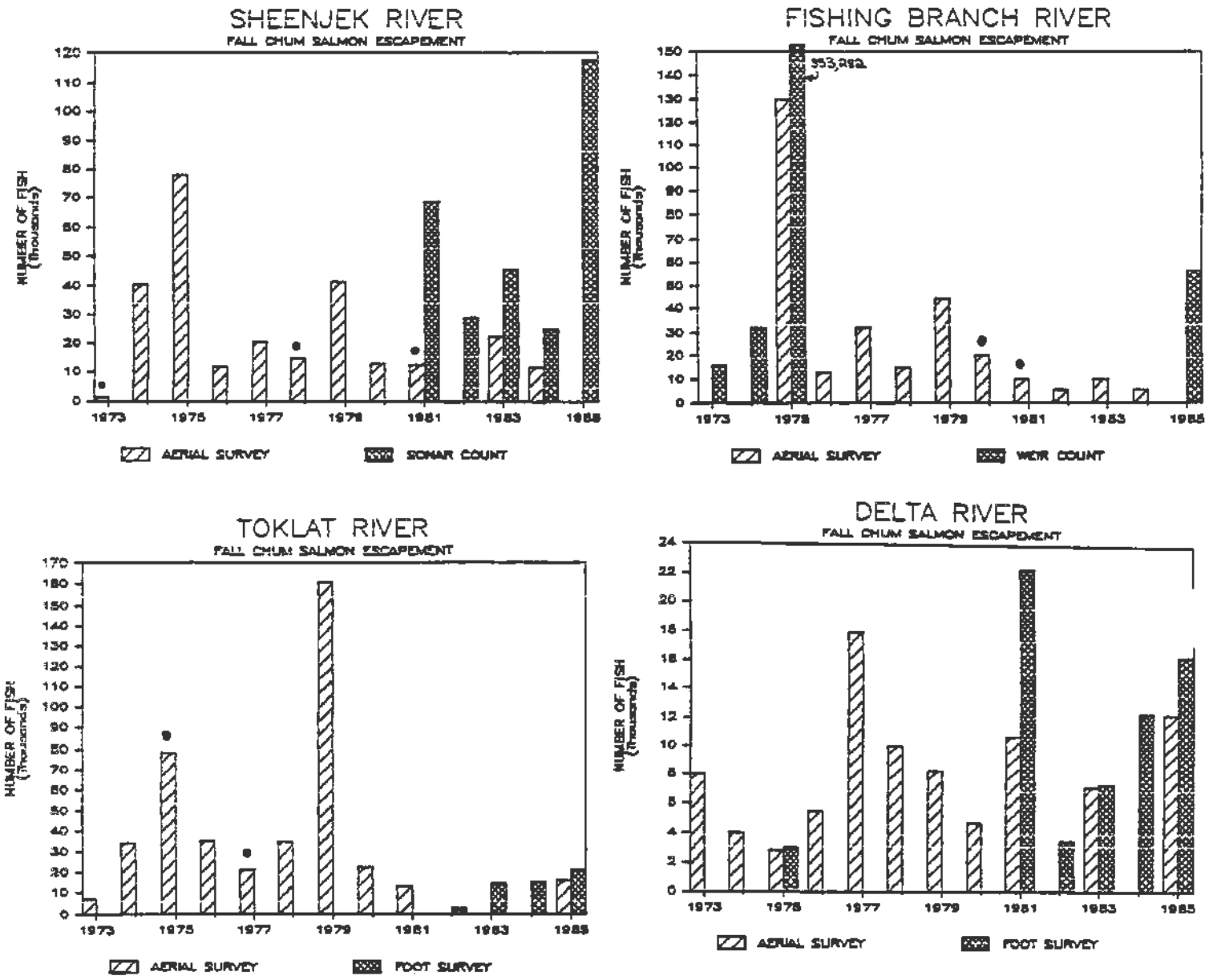

Figure 3. Fall chum salmon escapement counts in selected Yukon River spawning areas, 1973-1985. (Aerial survey estimates unless otherwise noted. • = poor survey conditions).

Figure 4.

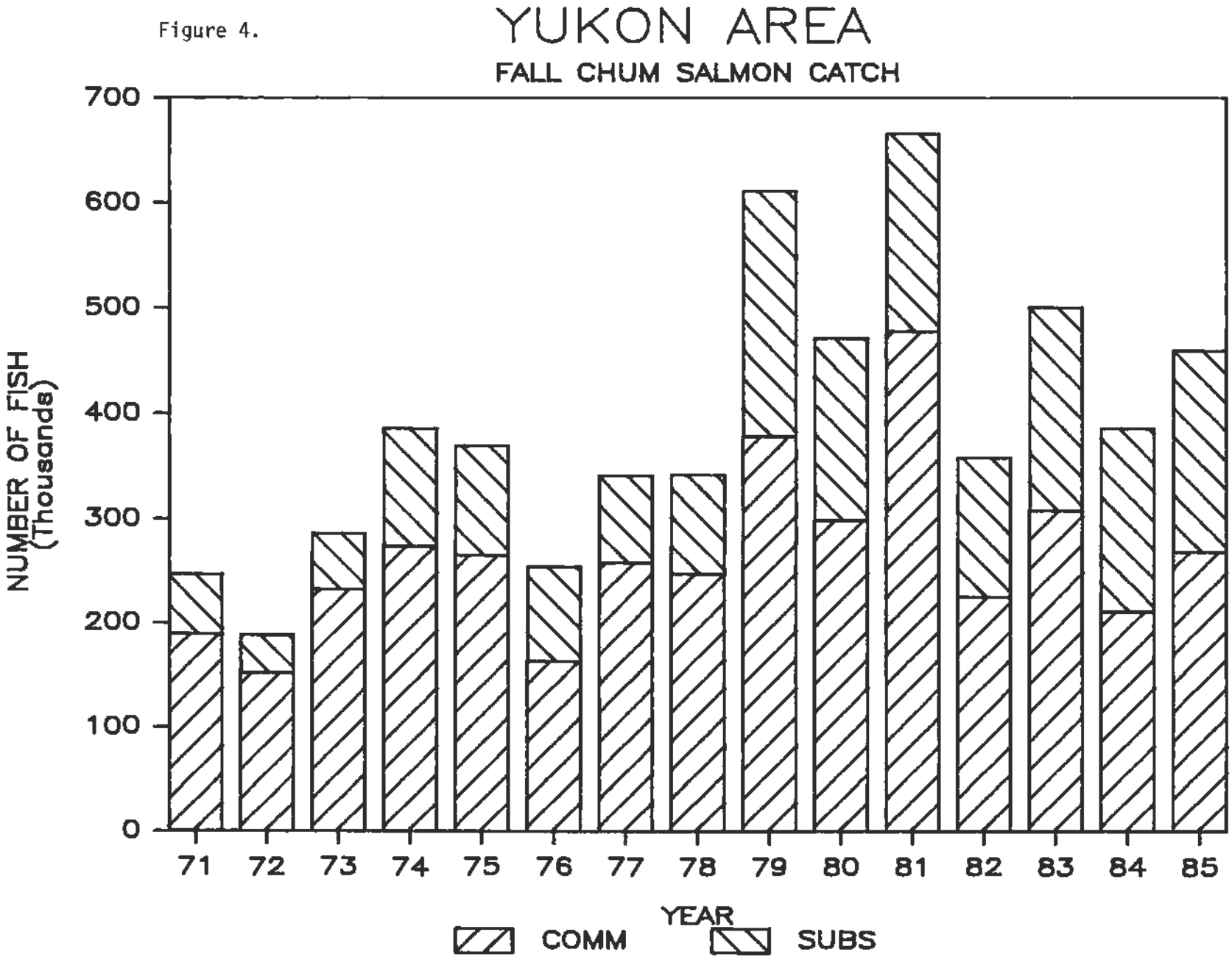
YUKON AREA
FALL CHUM SALMON CATCH
NUMBER OF FISH
(Thousands)
700
600
500
400
300
200
100
0
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
YEAR
COMM
SUBS

Table 1. Commercial salmon catches, Yukon area, 1961 - 1985. a/

Year	King	Summer chum b/	Fall chum b/	Total chum b/	Coho b/	Total b/
1961	120,260	-	42,577	42,577	2,855	165,692
1962	94,374	-	53,160	53,160	22,926	170,820
1963	116,994	-	-	-	5,572	122,566
1964	93,587	-	8,347	8,347	2,446	104,380
1965	118,098	-	23,317	23,317	350	141,765
1966	93,315	-	71,045	71,045	19,254	183,614
1967	129,706	11,179	38,274	49,453	11,047	190,206
1968	106,526	14,470	52,925	67,395	13,303	187,224
1969	90,223	60,569	131,291	191,860	14,981	297,064
1970	80,269	137,368	209,356	346,724	12,245	439,238
1971	110,507	100,090	189,594	289,684	12,203	412,394
1972	92,840	135,668	152,176	287,844	22,233	402,917
1973	75,353	285,844	232,090	517,934	36,641	630,029
1974	97,919	604,210	273,158	877,368	16,240	993,402
1975	63,740	728,156	265,156	993,312	2,346	1,050,945
1976	88,671	598,227	163,282	761,509	5,197	855,377
1977	96,414	548,958	257,986	806,944	38,021	941,379
1978	97,602	1,045,092	247,011	1,292,103	25,960	1,415,665
1979	129,056	803,500	378,412	1,181,912	17,110	1,328,078
1980	155,088	1,057,761	298,450	1,356,211	8,741	1,520,040
1981	157,607	1,191,812	477,736	1,669,548	23,702	1,850,857
1982	123,658	614,166	224,992	839,158	37,176	999,992
1983	147,910	894,878	307,662	1,202,540	13,320	1,363,770
1984	119,904	755,821	210,560	966,381	81,940	1,168,225
1985 c/	146,188	765,622	267,744	1,033,366	57,670	1,237,224
5 yr average (1980-1984)	140,833	902,868	303,880	1,206,768	32,978	1,380,577

a/ Does not include Canadian catches.
b/ Includes "equivalent numbers" of salmon converted from roe sales.
c/ Preliminary data.

Table 2. Subsistence salmon catches, Yukon area, 1961 - 1985

Year	King	Summer a/ Chum	Fall b/ Chum	Total Chum	Coho	Total
1961	21,488	305,317	101,772	407,089	-	428,577
1962	11,110	261,856	87,285	349,141	-	360,251
1963	24,862	297,094	99,031	396,125	-	420,987
1964	16,231	361,080	120,360	481,440	-	497,671
1965	16,608	336,848	112,283	449,131	-	465,739
1966	11,572	154,508	51,503	206,011	-	217,583
1967	16,448	206,233	68,744	274,977	-	291,425
1968	12,106	133,880	44,627	178,507	-	190,613
1969	14,000	156,191	52,063	208,254	-	222,254
1970	13,874	166,504	55,501	222,005	-	235,879
1971	25,684	171,487	57,162	228,649	-	254,333
1972	20,258	108,006	36,002	144,008	-	164,266
1973	24,317	161,012	53,670	214,682	-	238,999
1974	19,964	209,031	112,556	321,587	-	341,551
1975	13,045	194,011	104,468	298,479	-	311,524
1976	17,806	168,479	90,720	259,199	-	277,005
1977 c/	17,581	159,502	82,771	242,273	16,333	276,187
'8	30,297	197,137	94,867	292,004	7,787	330,088
/9	31,005	196,187	233,347	429,534	9,794	470,333
1980	42,724	272,398	172,657	445,055	20,158	507,937
1981	29,690	208,284	188,525	396,809	21,228	447,727
1982	28,158	260,969	132,897	393,866	35,894	457,918
1983	49,478	240,386	192,930	433,316	23,895	506,689
1984	42,389	230,565	174,664	405,229	48,936	496,554
1985 d/	40,000	250,000	192,000	442,000	50,000	532,000
5 year average (1980-1984)	38,488	242,520	172,335	414,855	30,022	483,365

a/ Includes small numbers of pinks
b/ Includes small numbers of cohos prior to 1977
c/ Prior to 1977 only king and "small salmon" were recorded during subsistence fishery surveys. Number of summer and fall chums are estimated for 1961-1976.
d/ Preliminary estimate

Table 3. Yukon area commercial salmon catch and effort data, 1985. a/

District/ Subdistrict	Number of Fishermen	Kings	Summer Chum b/		Fall Chum b/		Cohos	Total Salmon	
			Chum	Roe (lbs.)	Chum	Roe (lbs.)		Salmon	Roe (lbs.)
1	434	90,011	247,486	-	129,948	-	26,676	495,121	-
2	247	48,365	188,099	-	40,490	-	17,125	294,079	-
3	24	2,588	1,792	-	5,164	-	171	9,715	-
Total Lower Yukon	666	140,964	437,377	-	175,602	-	44,972	798,915	-
District 4									
4-A	55	-	227,279	222,149	-	-	-	227,279	222,149
4-B	18	318	21,091	19,306	14,468	891	153	36,030	20,197
4-C	15	346	10,722	5,630	9,984	1,634	785	21,837	7,264
Subtotal District 4	77	664	259,092	247,085	24,452	2,525	938	285,146	249,610
District 5									
5-A	6	-	-	-	565	-	-	565	-
5-B	14	1,142	700	-	9,263	-	-	11,105	-
5-C	28	1,842	-	-	13,332	-	-	15,174	-
5-D	1	434	-	-	2,178	-	-	2,612	-
Subtotal District 5	48	3,418	700	-	25,338	-	-	29,456	-
District 6									
6-A	3	15	809	-	1,462	-	432	2,718	-
6-B	21	560	51,274	142	34,663	-	9,626	96,123	142
6-C	8	567	16,370	1,398	6,227	-	1,702	24,866	1,398
Subtotal District 6	32	1,142	68,453	1,540	42,352	-	11,760	123,707	1,540
Total Upper Yukon	157	5,224	328,245	248,625	92,142	2,525	12,698	438,309	251,150
GRAND TOTAL	823	146,188	765,622	248,625	267,744	2,525	57,670	1,237,224	251,150

a/ Preliminary Data.
b/ Includes "equivalent numbers" of salmon converted from roe production.

Table 4. Subsistence and commercial fall chum salmon catches by district, Yukon Area, 1977-1984.

District	1977	1978	1979	1980	1981	1982	1983	1984
District 1								
Subsistence	5,085	390	15,788	7,433	15,540	10,016	8,238	8,885
Commercial	131,758	127,947	109,406	106,829	167,834	97,484	124,371	78,751
Subtotal	136,843	128,337	125,194	114,262	183,374	107,500	132,609	87,636
District 2								
Subsistence	5,989	1,297	14,662	12,435	11,770	9,511	10,341	11,394
Commercial	51,994	51,646	94,042	83,881	154,883	96,581	85,645	70,803
Subtotal	57,983	52,943	108,704	96,316	166,653	106,092	95,986	82,197
District 3								
Subsistence	461	266	2,443	2,320	2,893	1,659	2,863	2,074
Commercial	15,851	11,527	25,955	13,519	19,043	5,815	10,018	6,429
Subtotal	16,312	11,793	28,398	15,839	21,936	7,474	12,881	8,503
Lower Yukon Total								
Subsistence	11,535	1,953	32,893	22,188	30,203	21,186	21,442	22,353
Commercial	199,603	191,120	229,403	204,229	341,760	199,880	220,034	155,983
Total	211,138	193,073	262,296	226,417	371,963	221,066	241,476	178,336
District 4								
Subsistence a/	8,457	10,652	37,896	23,675	20,123	20,319	34,209	31,152
Commercial c/	13,980	12,709	52,098	32,325	13,393	4,061	6,445	9,840
Subtotal	22,437	23,361	89,994	56,000	33,516	24,380	40,654	40,992
District 5								
Subsistence b/	32,175	51,705	110,792	76,466	111,567	71,828	105,105	98,433
Commercial c/	25,730	26,236	55,556	42,376	93,575	13,635	43,993	24,117
Subtotal	57,905	77,941	166,348	118,842	205,142	85,463	149,098	122,550
District 6								
Subsistence	30,604	30,557	51,766	50,328	26,632	19,564	32,174	22,726
Commercial c/	18,673	16,946	41,355	19,520	29,008	7,416	37,190	20,620
Subtotal	49,277	47,503	93,121	69,848	55,640	26,980	69,364	43,346
Upper Yukon Total								
Subsistence	71,236	92,914	200,454	150,469	158,322	111,711	171,488	152,311
Commercial	58,383	55,891	149,009	94,221	135,976	25,112	87,628	54,577
Total	129,619	148,805	349,463	244,690	294,298	136,823	259,116	206,888
Area Total								
Subsistence	82,771	94,867	233,347	172,657	188,525	132,897	192,930	174,664
Commercial	257,986	247,011	378,412	298,450	477,736	224,992	307,662	210,560
Total	340,757	341,878	611,759	471,107	666,261	357,889	500,592	385,224

a/ Includes Innoko and Koyukuk River drainages.
b/ Includes Chandalar River drainages.
Includes "equivalent numbers" of salmon converted from roe sales.

Table 5. Canadian catch of Yukon River chum salmon (including Porcupine River), 1960-1984. a/

Year	Commercial	Non Commercial			Total
		Domestic	Indian Food Fish	Combined	
1960	5,493		10,115	10,115	15,608
1961	3,276		5,800	5,800	9,076
1962	936		8,500	8,500	9,436
1963	2,196		25,500	25,500	27,696
1964	1,929		10,258	10,258	12,187
1965	2,071		9,718	9,718	11,789
1966	3,157		10,035	10,035	13,192
1967	3,343		13618	13,618	16,961
1968	453		11,180	11,180	11,633
1969	2,279		5,497	5,497	7,776
1970	2,479		1,232	1,232	3,711
1971	1,761		15,150	15,150	16,911
1972	2,532		5,000	5,000	7,532
1973	2,806		7,329	7,329	10,135
1974	2,544	466	8,636	9,102	11,646
1975	2,500	4,600	13,500	18,100	20,600
1976	1,000	1,000	3,200	4,200	5,200
1977	3,990	1,499	6,990	8,489	12,479
1978	3,356	728	5,482	6,210	9,566
1979	9,084	2,000	11,000	13,000	22,084
1980	9,000	4,000	9,218	13,218	22,218
1981	15,260	1,611	5,410	7,021	22,281
1982	11,312	683	4,096	4,779	16,091
1983	25,990	300	3,200	3,500	29,490
1984	22,932	535	5,800	6,335	29,267
Average					
1960-64	2,766	--	12,035	12,035	14,801
1965-69	2,261	--	10,010	10,010	12,270
1970-74	2,424	--	7,469	7,563	9,987
1975-79	3,986	1,965	8,034	10,000	13,986
1980-84	16,899	1,426	5,545	6,971	23,869

a Catch in numbers of fish.

Table 6. Chinook salmon escapement counts for selected spawning areas in the Yukon River drainage, 1959-1985. a

Location	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
East Fork Andreafsky R		1020	1003	675[b]		867		361		380	231[b]	665	1904	798	825		993	818	2008	2487	1180	958[b]	2146[b]	1274		1573[b]	1617
West Fork Andreafsky R		1220		762[b]		705	355[b]	303	276	383	274[b]	574[b]	1682	582[b]	788	285	301	643	1499	1062	1134	1500	231[b]	851[b]		1993	2248
Anvik River Aerial		1950	1226				650[b]	638	336[b]	310[b]	296[b]	368										1330	807[b]		653[b]	641[b]	1051
Tower & Aerial or Boat														1198	613	471[b]	730	1154	1371	1324	1484						
Mulato River		756	543[b]													78[b]	204	648	487[b]	920	1507	1323[b]	791[b]		1006		2780
Chena River		132[b]			137[b]								193[b,c]	138[b,c]	21[b]	1035[c]	316[c]	531	563	1726	1159[b]	2541	600[b]	2073	2553	501	2553
Salcha River		1660	2878	937		450	408	800		739	461[b]	1882	158[b]	1193	391	1857	1055	1641	1202	3499	4789	6757	1237[b]	2534	1961	1031	2035
Big Salmon R (Big Salmon Lake-Gouch Cr)										827[b]	286[b]	670	200[b]	560	75[b]	70[b]	153[b]	86[b]	316[b]	524	632	1568	2411	757	540	1044	801
Nisutlin R (Sidney Cr-100 Mile Cr)										407	105[b]	615	650	237	35[b]	150[b]	239	102	77[b]	375	713	975	1626	578	701	832	409
Whitehorse Fishway	1054	660	1068	1500	484	587	903	563	533	414	334	625	856	391	224	273	313	121	277	725	1184	1383	1539	473	905	1042	536

a Date obtained by aerial survey unless otherwise noted. Only peak counts are listed.
b Incomplete survey and/or poor survey timing or conditions resulted in minimal or inaccurate count.
c Boat survey.

Table 7. Summer chum salmon escapement counts for selected spawning areas in the Yukon River drainage, 1973-1985. a

Location		1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
East Fork Andreafsky River	Aerial	10,149 b	3,215 b	223,485	105,347	112,722	127,050	66,471	36,823 b	81,555	7,501 b		95,200 b	66,146
	Sonar									147,312	181,352	110,608	70,125	
West Fork Andreafsky River		51,835	33,578	235,954	118,420	63,120	57,321	43,391	115,457		7,267 b		238,565	52,750
Anvik River	Tower/Aerial	86,665 b	201,277	845,485	406,166	252,854	251,339							
	Sonar							280,337	492,676	1,479,582	444,581	352,912	891,028	1,038,241
Nulato River			51,160	138,495	40,001 b	69,660	54,480	37,104	14,946 b	14,348 b		21,012 b		24,452
Hogatza River				22,355	20,744	10,734 b	5,102	14,221	19,786		4,984 b	28,141		22,566
Salcha River			3,510	7,573	6,474	677 b	5,405	3,060	4,140	8,500	3,756	716 b	9,810	3,178

a Data obtained by aerial survey unless otherwise noted. Only peak counts are listed.
b Incomplete survey and/or poor survey timing or conditions resulted in a minimal or inaccurate count.

Table 8. Fall chum salmon escapement counts for selected spawning areas in the Yukon River drainage, 1973-1985. a

Location		1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Toklat River	Aerial	6,957	34,310	78,285[b]	35,190	21,800[b]	35,000	161,090	23,054	13,907				16,254
	Foot										3,309	15,105	15,861	21,824
Delta River	Aerial	7,971	4,010	2,850	5,498	17,925	10,051	8,125	4,637	10,664		7,007		12,225
	Foot			3,089						22,375	3,433	7,230	12,327	16,158
Sheenjek River	Aerial	1,175[b]	40,507	78,060	11,866	20,506	14,610[b]	41,140	13,027	12,625[b]		22,230	11,402	
	Sonar									69,043	29,093	45,733	25,120	117,668
Fishing Branch River	Aerial			130,000	13,450	32,500	15,000	44,080	20,319[b]	10,549[b]	5,846	10,000	5,570	
	Weir	15,987	32,525	353,282										56,100

a Data obtained by aerial survey unless otherwise noted. Only peak counts are listed.
b Incomplete survey and/or poor survey timing or conditions resulted in a minimal or inaccurate count.